

Ser. No. 09/504,896

- 2 -

1. (amended) A method of generating laser pulses using a semiconductor laser diode as a lasing amplification medium of an extended laser cavity, the method comprising the steps of:

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- a) aligning elements making up the laser cavity for maximum laser output;
 - b) providing to the semiconductor laser diode an input current beyond a lasing threshold; and
 - c) misaligning at least one of the elements making the laser cavity to achieve passive mode-locked operation of the semiconductor laser diode.

18. (deleted)

19. (deleted)

20. (deleted)

- REMARKS -

The claim rejections indicated in the Examiner's action are as follows:

Claims	§112(2)	§103	Status/References
1-4, 8-10, 12, 13, 15-16		x	Loh et al.
18-20	x		

Drawings	37 CFR 1.83 (a)
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The Examiner has stated that claims 5-7, 11, 14, 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have deferred amending these claims at the present time in anticipation of favorable consideration of amended claim 1.

Ser. No. 09/504,896

- 3 -

Claim 1 has been voluntarily amended with a view to clarify the field in which the invention can be applied. Applicants have removed the term "self-modulated". Applicants strongly believe the "passive mode-locked operation of the semiconductor laser diode" sufficiently describes the regime in which the semiconductor diode is operating. The additional term "self-modulation" is unnecessary in further defining the operation of the semiconductor and may cause confusion as to the actual function of the system.

In view of the above amendment, Applicants respectfully submits that the cited reference of Loh et al. (hereinafter referred to as Loh) does not disclose or suggest Applicants' invention. Loh discloses an "Ultrahigh Frequency Optical Self-Modulator". The Loh system is a linear one wherein a misalignment of a mirror causes an increase in the frequency of modulation of polarization. The laser modes are not in phase and the modulation occurs every second round trip of the cavity. There must be a wave plate in the cavity, as shown in figure 2, element 30, in order to have polarization self-modulation. The waveforms produced from this system are nearly square or sinusoidal waveforms and the signal rarely goes to zero. The actual self-modulation that occurs is not directly caused by the misalignment of the mirror in the cavity. The only result from the misalignment is the increase (or decrease) in the polarization modulation frequency without affecting the laser mode of operation. Loh's system never goes into mode-locked operation.

Applicants' invention differs from Loh in that misaligning at least one of the elements making the laser cavity will achieve passive mode-locked operation. This regime is completely different from polarization self-modulation. Furthermore, the system is non-linear, the self-modulation occurs once every round trip of the cavity, there is no wave plate present, and the waveform produced is a train of impulses. The mode-locked

Ser. No. 09/504,896

- 4 -

operation signifies that the modes of the system are all in phase and a series of pulses is produced. The misalignment causes the system to operate in a special regime without controlling a variable parameter. It is this misalignment that allows the mode-locked operation to occur and it is this feature that distinguishes the invention from the state of the art.

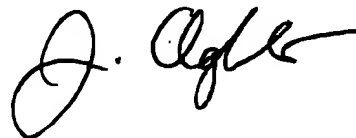
Loh teaches that an adjustment in alignment will bring about a variation in a frequency of modulation of the beam polarization. This knowledge does not suggest that an adjustment in alignment will cause a laser to begin to operate in a passive mode-locked operation. Therefore, a person having ordinary skill in the art in this field does not have the capability of understanding the scientific and engineering principles applicable to the claimed invention and would not know to provide misalignment to the lens or output couples in order to obtain passive mode-locked operation.

Applicant has deleted claims 18-20 from the application. Applicant believes this amendment to overcome the Examiner's objections with respect to the drawings as well as the Examiner's rejection of claims 18-20 on the basis of 35 USC 112(2).

In view of the foregoing, reconsideration of the rejection of claims 1-17 is respectfully requested. It is believed that claims 1-17 are allowable over the prior art, and a Notice of Allowance is earnestly solicited.

Respectfully submitted,
Patrick Langlois et al.

By:



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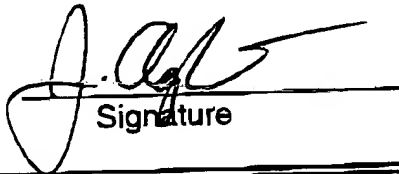
Ser. No. 09/504,896

- 5 -

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Marked up copy of claims in accordance with 37CFR§1.121(c)(ii)

1. (amended) A method of generating laser pulses using a semiconductor laser diode as a lasing amplification medium of an extended laser cavity, the method comprising the steps of:

- d) aligning elements making up the laser cavity for maximum laser output;
- e) providing to the semiconductor laser diode an input current beyond a lasing threshold; and
- f) misaligning at least one of the elements making the laser cavity to achieve passive ~~self-modulated~~ mode-locked operation of the semiconductor laser diode.

2. (unamended) A method as claimed in claim 1, wherein prior to the step of aligning the elements making up the laser cavity for maximum laser output the method further comprises the step of providing a lasing threshold input current to the semiconductor laser diode.

3. (unamended) A method as claimed in claim 2, wherein the step of providing the lasing threshold input current, further comprises the step of providing a direct current input current to the semiconductor laser diode.

4. (unamended) A method as claimed in claim 1, wherein the laser cavity is a ring laser cavity.

5. (unamended) A method as claimed in claim 1, wherein the semiconductor laser diode further comprises a defect providing a dual-wavelength operation.

6. (unamended) A method as claimed in claim 5, wherein the semiconductor laser diode has two end facets and the defect is further located closer to one of the end facets.

7. (unamended) A method as claimed in claim 5, wherein the semiconductor laser diode has two end facets and the defect is further located at one of the end facets.
8. (unamended) A method as claimed in claim 1, wherein the elements making up the laser cavity are optical elements and the step of aligning the optical elements of the laser cavity for maximum laser output further comprises the step of achieving maximum continuous wave laser output operation of the semiconductor laser diode at the lasing threshold input current.
9. (unamended) A method as claimed in claim 1, wherein the extended laser cavity includes at least one mirror and the step of misaligning at least one element further comprises misaligning the at least one mirror.
10. (unamended) A method as claimed in claim 9, wherein the step of misaligning the at least one mirror further comprises the step of misaligning the at least one mirror in a plane of the lasing medium of the semiconductor laser diode.
11. (unamended) A method as claimed in claim 9, wherein the semiconductor laser diode has an emission output favoring the amplification of at least one center wavelength at the lasing threshold and the step of misaligning the at least one mirror in the plane of the lasing medium further comprises the step of misaligning the mirror to favor amplification of wavelengths shorter than the at least one center wavelength.
12. (unamended) A method as claimed in claim 1, wherein the extended laser cavity includes at least one lens and the step of misaligning at least one element further comprises misaligning the at least one lens.
13. (unamended) A method as claimed in claim 12, wherein the step of misaligning the at least one lens further comprises the step of misaligning the

at least one lens by shifting the lens along a direction of propagation of a laser signal within the laser cavity.

14. (unamended) A method as claimed in claim 13, wherein the semiconductor laser diode has an emission output favoring the amplification of at least one center wavelength at the lasing threshold and the step of misaligning the at least one lens further comprises the step of misaligning the lens to introduce color aberration in the laser cavity to favor amplification of wavelengths shorter than the at least one center wavelength.
15. (unamended) A method as claimed in claim 1, wherein the extended laser cavity includes at least one output coupler and the step of misaligning at least one element further comprises misaligning the at least one output coupler.
16. (unamended) A method as claimed in claim 15, wherein the step of misaligning the at least one coupler further comprises the step of misaligning the at least one output coupler in a plane of the lasing medium of the semiconductor laser diode.
17. (unamended) A method as claimed in claim 15, wherein the semiconductor laser diode has an emission output favoring the amplification of at least one center wavelength at the lasing threshold and the step of misaligning the at least one output coupler in the plane of the lasing medium further comprises the step of misaligning the output coupler to favor amplification of wavelengths shorter than the at least one center wavelength.
18. ~~(deleted) A method as claimed in claim 1, wherein the extended laser cavity includes at least one prism and the step of misaligning at least one element further comprises misaligning the at least one prism.~~

19. ~~(deleted) A method as claimed in claim 18, wherein the step of misaligning the at least one prism further comprises the step of misaligning the at least one prism in the plane of the lasing medium of the semiconductor laser diode.~~
20. ~~(deleted) A method as claimed in claim 18, wherein the semiconductor laser diode has an emission output favoring the amplification of at least one center wavelength at the lasing threshold and the step of misaligning the at least one prism in the plane of the lasing medium further comprises the step of misaligning the at least one prism to favor amplification of wavelengths shorter than the at least one center wavelength.~~